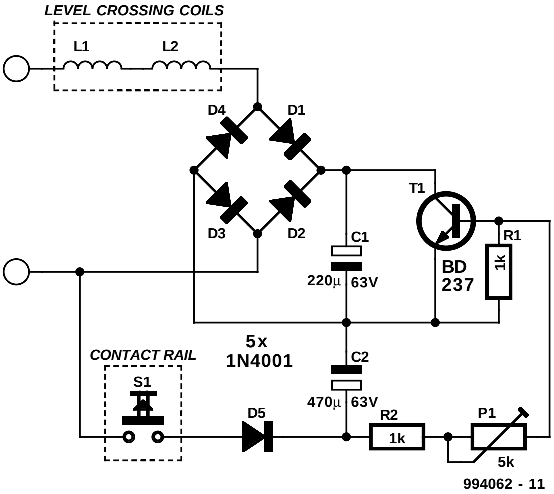
railway barrier monitor

033



W. Heyn

The rails and wheels of railway carriages are liable to oxidizing no matter how carefully they are maintained. After a while this causes problems when the train moves across a level crossing since the oxidization causes unreliable contacts of the relevant switches so that correct and timely closing of the barrier (lifting boom or traditional gate) does not take place. As long as the switch contacts are sound, the barrier closes rapidly and timely. This is ensured by the circuit in the diagram, which may be used with a variety of model railway systems.

When track switch S_1 is open, supply voltage for transistor T_1 is provided via rectifiers D_1–D_4. The transistor is off, so that no current flows and the barrier is open. When an approaching train closes the track switch, capacitor C_2 is charged slowly via diode D_1. This results in the base voltage of T_1 rising from 0 V to 0.8 V, so that the transistor begins to conduct. Consequently, a gradually increasing current flows through the barrier solenoids, L_1, L_2, whereupon the barrier closes slowly.

When the switch contact is opened briefly, transistor T_1 remains on as long as the charge on, and thus the potential across, capacitor C_2 is sufficient. The barrier then remains closed. The time taken by C_2 to become discharged depends on the setting of P_1.

When the train has left the relevant section of track switch, S_1 is opened, and capacitor C_2 is discharged via R_1-P_1-R_2. The transistor is then cut off, capacitor C_1 is charged, and the barrier opens.

In the case of direct-voltage systems, diodes D_2 and D_4 are not needed.

[994062]